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(54) Portable socket outlet and system of portable socket outlets with modular structure

(57) A portable socket outlet (10) comprising a box-shaped body (11) shaped substantially like an elongated parallelepiped, provided with electrical functions (12), in particular power sockets for plugs of any standard, said box body (11) being provided, at its ends, with complementary connecting elements, in particular a plug (13) and a socket (14), which may be connected to corresponding elements (14, 13) of other portable socket outlets (10) to form a modular system, said plug (13) being also connectable to a power supply unit with complementary socket (14'), said box body may be provided, on the side opposite the power sockets or other electrical functions, with a channel (30) for receiving and concealing leads for signal lines (telephone, radio frequency, TV) for feeding signal sockets associated with the power sockets.

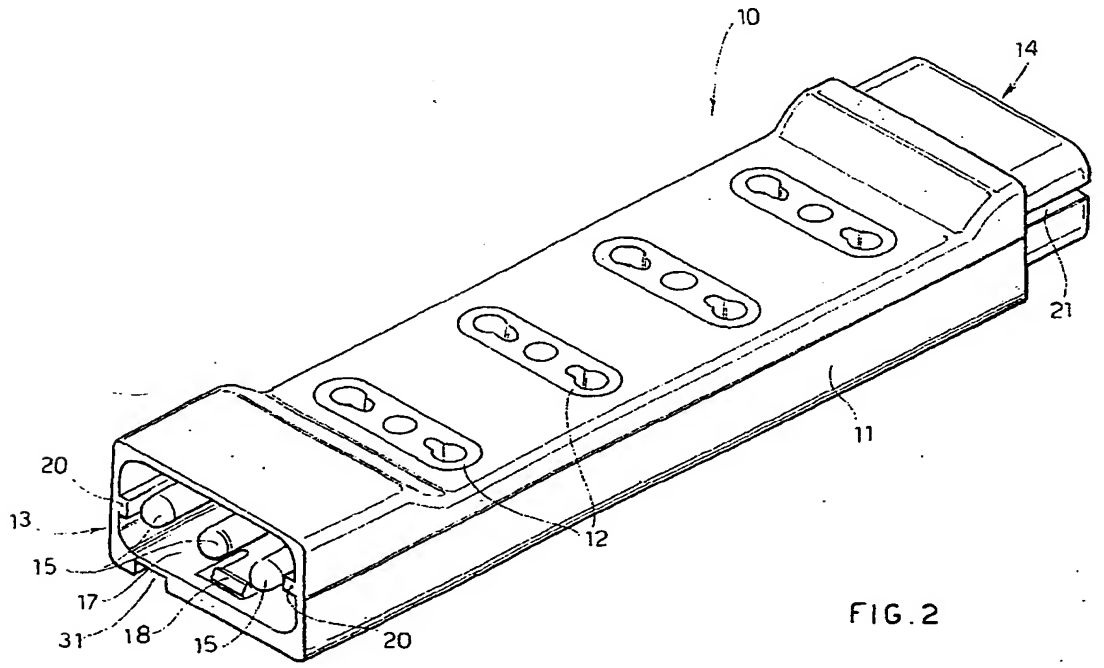

FIG.2

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Description

[0001] This invention concerns a portable socket outlet, in particular a multiple portable socket outlet, with possibility of modular connection with multiple portable socket outlets of the same type.

[0002] As is known, a multiple portable socket outlet, or table socket, comprises a box-shaped body containing a number of socket functions, suited for receiving straight plugs with cylindrical pins of different diameters, according to Italian standards, or flat pins according to the American standard, or round pins, according to the German standard, and so on.

[0003] Of the annexed drawings, Fig. 1 illustrates an example of a multiple portable socket outlet according to the prior art, suited for receiving straight type plugs.

[0004] As may be seen, coming out of the box body 1 of said multiple socket outlet is a power cable 2, which may be connected to the mains by means of a plug 3.

[0005] In practice, therefore, the power cable 2 is an integral part of the portable socket outlet and is supplied preassembled with the socket, or is wired up by the user at the moment of assembly. In any case, the cable 2 comes directly out of the box body 1 of the socket.

[0006] This leads to various problems.

[0007] A multiple socket outlet with a preconnected power cable can be used only for supplying electric appliances fitted with plugs that fit the sockets on the multiple portable socket outlet. Consequently, electric appliances with plugs of a different type cannot be supplied by means of said portable socket outlet, so the user must use stratagems to connect the electrical appliances to the mains, for example using a portable socket of a different type, and he must have another power supply point, derived from the fixed system, for example a wall socket.

[0008] Another drawback of the known portable socket outlets is that they obviously have a limited number of socket functions, and not all of these are always used for the reasons explained above. In practice, the user has a certain number of electrical appliances to supply, with plugs of different types, and it is difficult for him to manage to connect them all to a single, or even to several multiple portable socket outlets according to the prior art.

[0009] He would therefore have to have a plurality of portable socket outlets to use according to his needs. This would involve a relatively high investment in this sphere of devices, with the result that, in most cases, he is content to have one or two multiple socket outlets at home, with the frequent consequence, especially when he buys a new electrical appliance, that the plug fitted on it cannot be connected to the multiple socket or sockets that the user owns. So he makes a makeshift connection to the mains, often at the risk of his personal safety.

[0010] On the whole, the existing multiple portable socket outlets are unable to cope with the demands of the users.

[0011] To make another example, in some particular cases it would be useful to have protection upstream from the socket, for example a magnetothermal switch or an overload discharger, solutions which have already been adopted in the prior art, and which obviously involve an increase in cost of the multiple socket outlet, in which the protection module is integrated. Such a solution does not appear to be satisfactory, because it obliges the user to have the protection, even when this would not be necessary, with consequent economic waste.

[0012] The aim of the invention is to solve this and other problems of multiple socket outlets according to the prior art.

[0013] In particular, the principal aim of the invention is to provide a multiple portable socket outlet or a multiple table socket which may be composed in a modular fashion with multiple sockets of the same type, so as to create a system of modular mobile socket outlets.

[0014] Another aim of the invention is to provide such a mobile socket outlet, without a power cable, but which may be connected to a power supply unit, by means of a direct connection.

[0015] Another aim of the invention is to provide such a mobile socket outlet which, for safety reasons, cannot be directly connected to a fixed wall socket.

[0016] Another aim of the invention is to provide such a multiple mobile socket outlet which may be connected to the mains by means of a dedicated socket, which can however also hold an ordinary plug.

[0017] Another aim of the invention is to be able to realise a protection or sectioning module which may be connected in any point of the modular structured assembly for sectioning and/or protection of that which is connected downstream and electrically dimensioned in a coordinated way with the electrical parameters of the appliances to be connected downstream.

[0018] These and other aims are achieved according to the invention with the characteristics expressed in the annexed independent claims 1 and 11.

[0019] Advantageous embodiments of the invention are described in the dependent claims.

[0020] Substantially, the portable socket outlet according to the invention has, on the two opposing ends, respective complementary connectors, a plug and a standard socket.

[0021] In this way, several portable socket outlets according to the invention may be modularly composed in order to reach the desired number of socket functions.

[0022] Of course, with the modular assembly or system according to the invention, each module may include sockets with different standards, so that, according to his needs, the user can make up the composition of sockets that he wants.

[0023] The various modules may have a different length and therefore a variable number of socket functions.

[0024] Conveniently, the plug connecting element provided at the end of each module can mate only with a connecting socket element provided at the other end of the module, or with a socket connecting element acting as a power supply unit, having the same shape.

[0025] This prevents the possibility of modules of the modular assembly according to the invention being electrically connected to just any socket, thus avoiding the risk of unstable or dangerous connections.

[0026] However, it is preferable that the connecting socket element provided at one head end of each module be able to hold also a standard plug, so as to increase the number of electrical appliances that can be connected to a multiple socket outlet according to the invention.

[0027] Further characteristics of the invention will be more clear from the detailed description below, referring to a purely examplary and therefore not limiting embodiment thereof, illustrated in the appended drawings, in which:

- Fig. 1 is an illustration of a multiple portable socket outlet according to the prior art;
- Fig. 2 is an axonometric view of a multiple portable socket outlet according to the invention, forming an element of a modular system;
- Fig. 3 is a top plan view of the element in Fig. 2;
- Figg. 3a, 3b, 3c and 3d are, respectively, a side elevational view, a bottom plan view, a left-hand view and a right-hand view of the portable multiple socket outlet in Fig. 3;
- Fig. 4 is an axonometric view of a portable socket connecting element, which may be connected to a complementary connecting plug element provided on the multiple socket outlet in Fig. 2, and on each element of the modular system according to the invention;
- Figg. 4a, 4b and 4c are, respectively, a top plan view, a side elevational view and a front view of the portable socket in Fig. 4;
- Fig. 5 is a top plan view of a composition or assembly of multiple portable socket outlets according to the invention, comprising three different modules and a power supply connector;
- Fig. 6 shows the same assembly as Fig. 5, with the various elements disconnected.

[0028] With reference to the figures from 2 to 6, the reference 10 is a multiple portable socket outlet module according to the invention, comprising a box-shaped body 11, shaped substantially like an elongated parallelepiped, in which are arranged a plurality of electrical functions 12, in particular power sockets, which in the embodiment in Figg. 2 and 3 are suitable for holding straight plugs with cylindrical pins, according to two different standards.

[0029] These power sockets 12 may be arranged on any wall of the box-shaped body 11, and even on several walls.

[0030] According to a characteristic of the invention, corresponding to the two ends of the box-shaped body 11 there are respective complementary connecting elements, in particular a plug 13 and a socket 14 of standard type.

[0031] In the example illustrated, the plug 13 has two cylindrical pins 15, suitable for being inserted in corresponding holes 16 in a complementary socket 14.

[0032] Conveniently, as illustrated in the annexed figures, the pins 15 are in a niche 17, suitable for preventing a direct connection of the module 10, for example to a fixed wall socket, which would lead to an unstable and unsafe connection.

[0033] To feed the module 10 a socket 14' must therefore be used (see Figg. 4-4c), for example of a portable type, having the same shape as the socket 14, provided at one end of the module 10.

[0034] In order to give greater stability and safety to the connection of the module 10 to the power supply unit, composed of the socket 14', and to the connection of several modules together (Fig. 5, 6), complementary retaining elements are provided, comprising an elastic tooth 18, created in one wall of the niche 17 of the plug 13, and a corresponding notch 19 provided in the body of the socket connector 14, 14'.

[0035] For this purpose, to prevent other sockets from connecting to the plug 13 of the module 10, thus making the electrical connection unsafe, complementary guide and fitting units are provided which, in the embodiment illustrated in the drawings, are composed of a pair of lengthways ribs 20, protruding from two opposite walls inside the niche 17 of the plug 13, and arranged offset with respect to the horizontal centre line of the plug 13, and of two corresponding longitudinal grooves 21 on the socket 14, 14', suited for receiving said ribs 20.

[0036] Consequently, a socket without the grooves 21 cannot be connected to the plug 13 of the module 10.

[0037] The plug 13 is therefore dedicated to the socket 14'. However, the socket 14' can hold standard plugs of the same type.

[0038] This is particularly advantageous for the socket 14 placed at one end of the module 10, as it can be used for connecting an electrical appliance when it is not used for connection to another module.

[0039] Figg. 5 and 6 illustrate, purely as an example, a possible composition or assembly of modules 10. In particular, a module 10" is provided, with three sockets which can also hold plugs according to the German standard and a module 10' with four sockets for plugs according to Italian standards. Upstream from the composition is a module 10"' with a protection switch 30, such as a magnetothermal switch, an overload discharger or surge diverter, a two-pole switch or other type, which trips to block the power supply to the sockets 12 downstream from the switch in the event of malfunction.

[0040] The protection switch 30 may of course be ar-

ranged in a different position in the assembly. For example, in the configuration shown in Fig. 5, the module 10" with sockets 12 for plugs according to the German standard, normally used for appliances that absorb a lot of current, may be fitted upstream, placing immediately downstream from it the module 10"' with the protection switch 30, while the module 10' with sockets for plugs according to Italian standards is positioned downstream from the whole composition. In this case, if there is a malfunction in one of the electrical appliances connected to one of the sockets in the module 10', the protection 30 of the module 10"' intervenes and isolates the corresponding module downstream, while the electrical appliances connected to the module 10" continue to be fed by the socket 14'.

[0041] The various modules 10 may of course include any number of socket functions 12, in compatibility with the dimensions of the power supply cable 2.

[0042] Likewise, in the modular system according to the invention, particular modules may be contemplated, comprising for example a filter for radio disturbances, a fuse, or even an electronic device for managing the loads downstream.

[0043] A further element which characterizes the invention is the possibility of making, in the box-shaped body of each module 10, on the face opposite the socket outlets, a channel 31, suitable for containing signal line leads (for example telephone signals, radio frequency signals, data transmission lines), thus allowing a line dedicated to the above signals to be laid in said channel, said line being concealed by the modules, and leading to signal sockets, TV sockets, data sockets for use together with the electric power supply for operating telephone appliances, TV sets, computers, etc.

[0044] In practice, the signal line lead travels from the point of connection to the corresponding mains, physically separated from the power cable 2, and is laid in said channel 31 of the modules 10, normally coming out at the end of the assembly of modules 10 and connecting to a separate signal socket.

[0045] In the channel 31, retaining means may be provided for firmly holding the signal line lead(s).

[0046] In the appended drawings, the channel 31 has been created in the thickness of the wall of the box body 11 of each module 10.

[0047] However, it is clear that the channel 31, especially if we want to increase its dimensions, may be provided as a hollow in the corresponding wall, which is arranged inside the box body 11, while remaining open on the outside.

[0048] In this case, this hollow, which clearly also concerns the niche 17 of the plug 13, may perform the function of one of said guiding ribs 20, mating with a corresponding groove provided in the plug 14'.

[0049] From the above, the advantages of the invention are clear, as, with a limited number of modules 10 and with a socket power supply unit 14', it can satisfy any demand of the user who can make up an assembly suitable to satisfy all his needs.

[0050] The invention is of course not limited to the particular embodiment described above and illustrated in the appended drawings, but numerous modifications in its details within the reach of any person skilled in the art can be made, all of which are to be considered within the scope of the appended claims.

Claims

1. Portable socket outlet connectable to an electric power distribution mains, comprising at least one electrical function (12), in particular an electric socket of any standard for the connection of electrical appliances, **characterised in that** said portable socket outlet (10) comprises, at its two opposite ends, complementary connecting elements, in particular a plug (13) and a socket (14), and **in that** the connection to the mains of said portable socket outlet (10) is achieved by means of connecting said plug (13) to a complementary power socket (14').

2. Portable socket outlet according to claim 1, **characterised in that** it comprises a box-shaped body (11) shaped like a flattened parallelepiped, in which are arranged a plurality of said socket functions (12), said complementary plug (13) and socket (14) connection elements being arranged at the two ends of said box body (11).

3. Portable socket outlet according to claim 2, **characterised in that** said socket functions (12) are arranged on one or more walls of said box-shaped body (11).

4. Portable socket outlet according to claim 1, 2 or 3, **characterised in that** the pins (15) of said plug (13) are in a niche (17) suitable for preventing a direct connection of the portable socket outlet (10) to a wall socket.

5. Portable socket outlet according to any of the previous claims, **characterised in that** said plug (13) and said socket (14, 14') have complementary retaining means (18, 19), suitable for guaranteeing the stability of the connection.

6. Portable socket outlet according to claim 5, wherein said complementary retaining means comprise an elastic tooth (18) and a corresponding notch (19).

7. Portable socket outlet according to any of the previous claims, **characterised in that** said plug (13) and said socket (14, 14') have reciprocal mating or engaging means, suitable for preventing other sockets from connecting to said plug (13).

8. Portable socket outlet according to claim 7, wherein said reciprocal mating means comprise at least a longitudinal rib (20) and a corresponding longitudinal groove (21).

9. Portable socket outlet according to any of the previous claims, **characterised in that** said retaining means (18 or 19) and said engaging means (20 or 21) provided on said socket (14; 14') do not prevent connection to it of a plug of the same standard, without said complementary retaining means (19 or 18) and/or said engaging means (21 or 20).

10. Portable socket outlet according to claims from 1 to 9, **characterised in that** it is provided with at least one longitudinal groove suitable for containing a canalizing and camouflaging dedicated line for telephone signals, radio frequency signals and data transmission signals so as to obtain from the system power supply and operation of telephone appliances, TV sets, computers, etc.

11. System of modular multiple socket outlets, comprising a plurality of modules (10) according to any one of the previous claims, which may be assembled together by connecting said complementary plugs and sockets (13, 14).

12. System of portable socket outlets according to claim 11, **characterised in that** it comprises a protection, filter, control or command module (10") placed upstream from at least one of said modules (10) with power sockets (12).

13. A protection, filter, control, command module having the characteristics of the portable socket outlet according to claims 1 to 10.

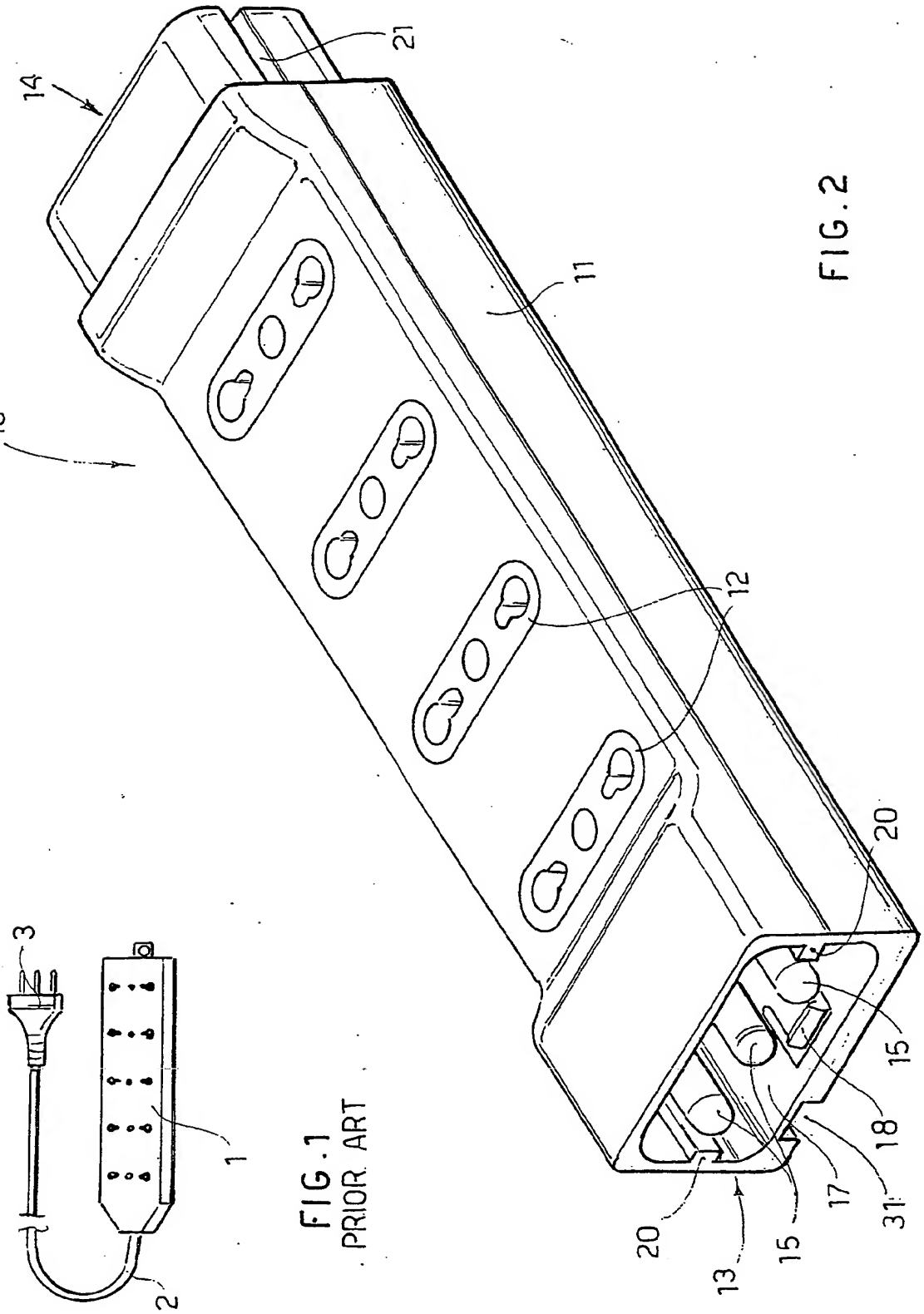


FIG. 2

FIG. 1
PRIOR ART

FIG.3

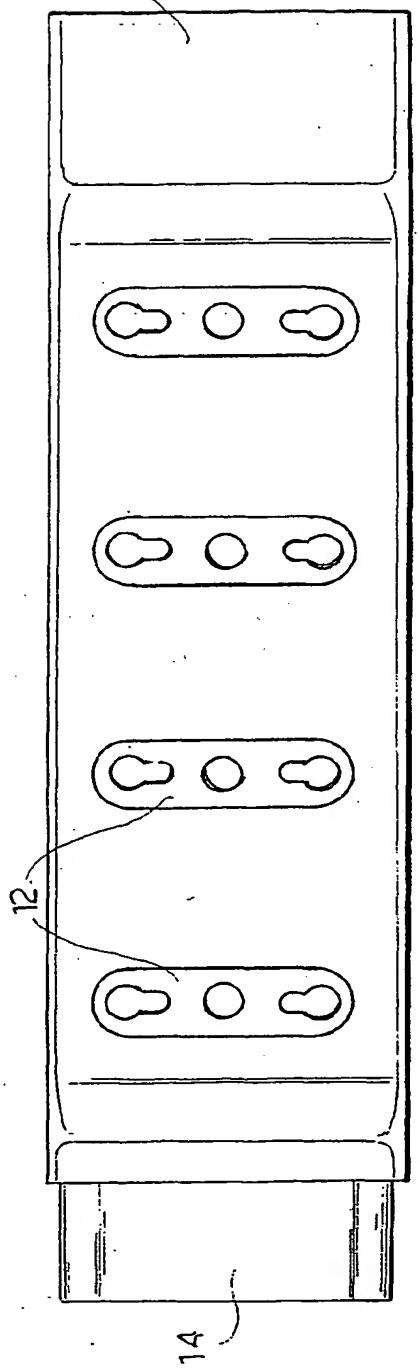


FIG.3a

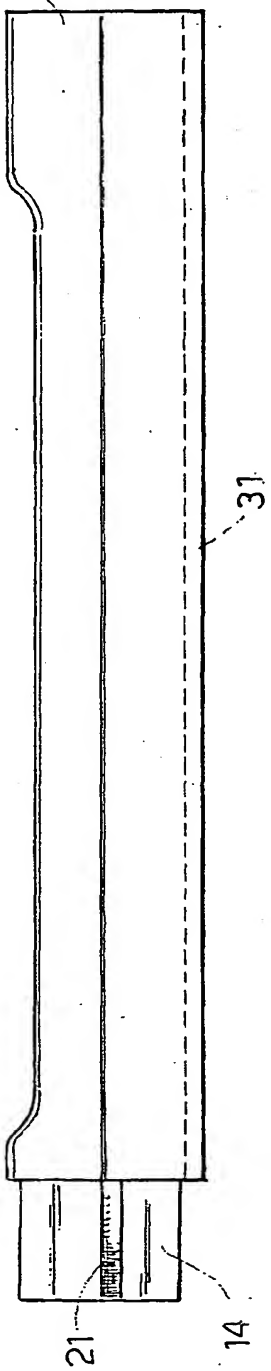
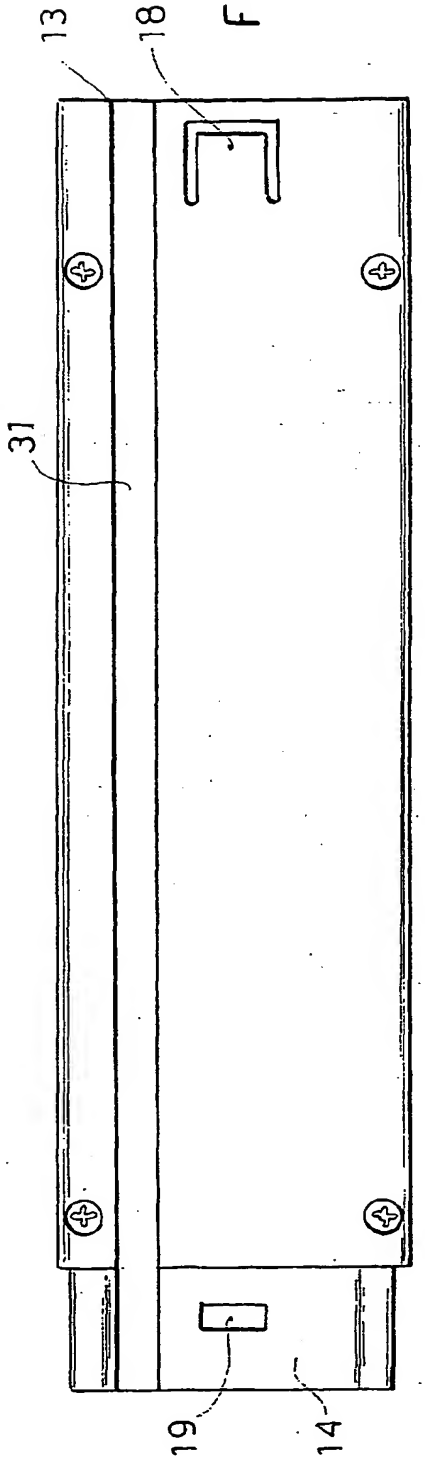


FIG.3b



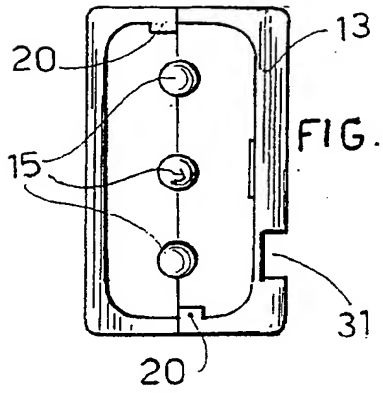


FIG.3d

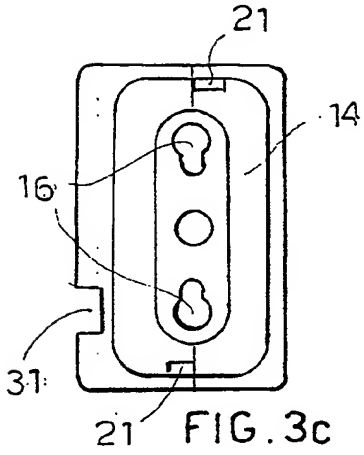
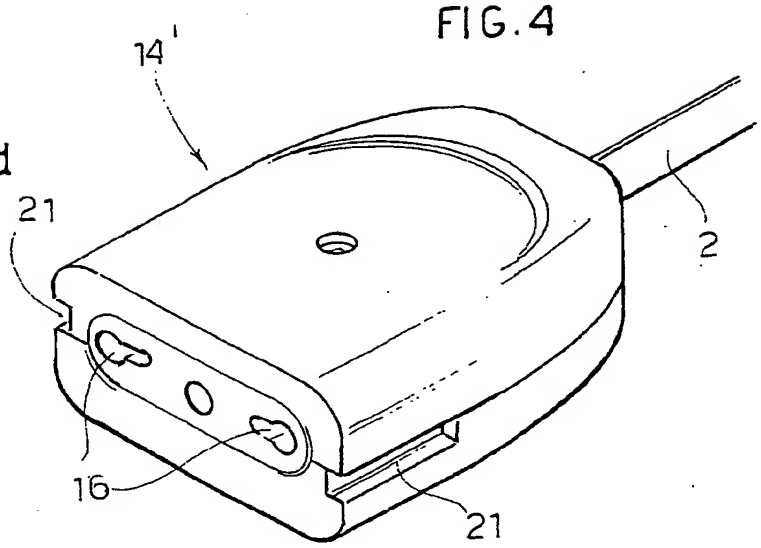


FIG.3c

FIG.4



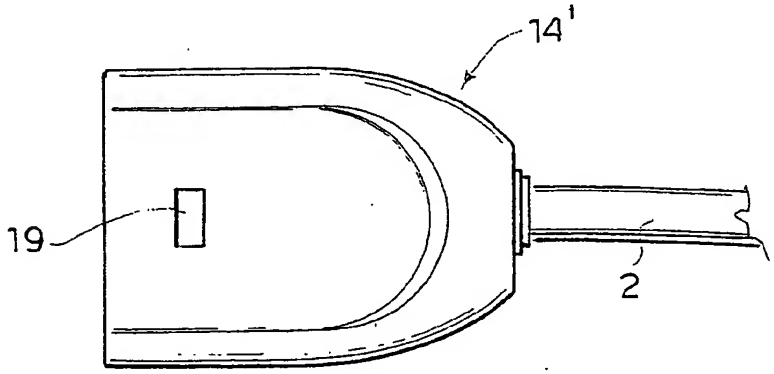


FIG. 4a

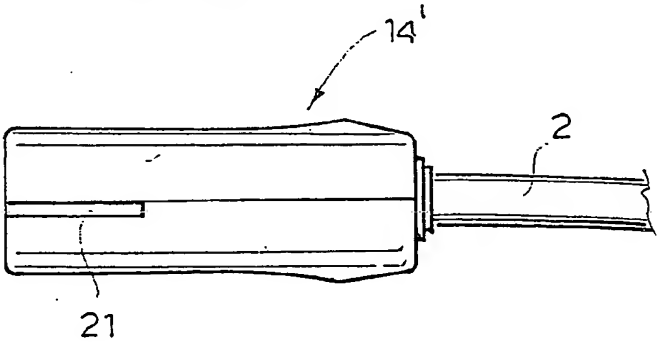


FIG.4b

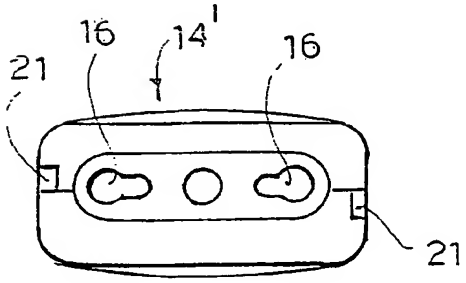


FIG.4c

FIG. 5

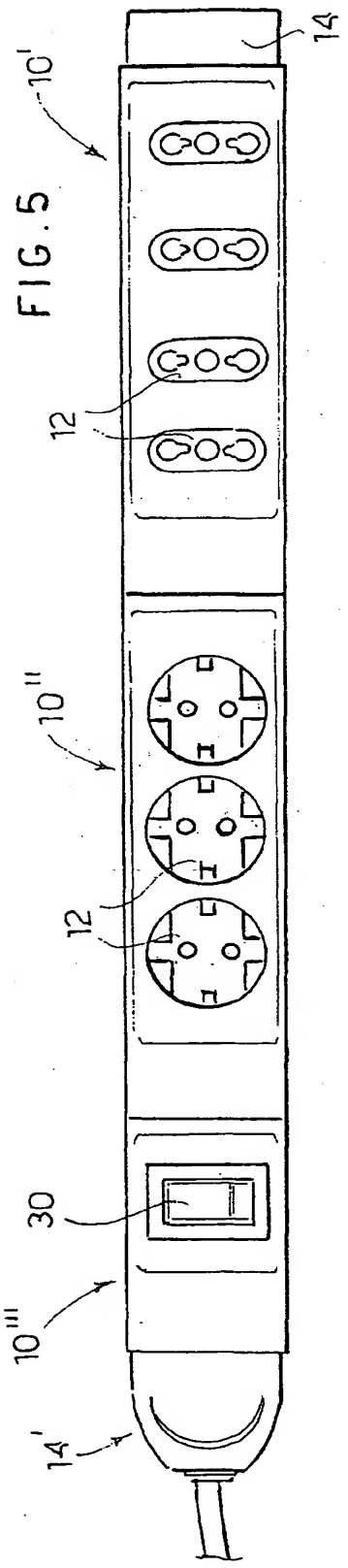
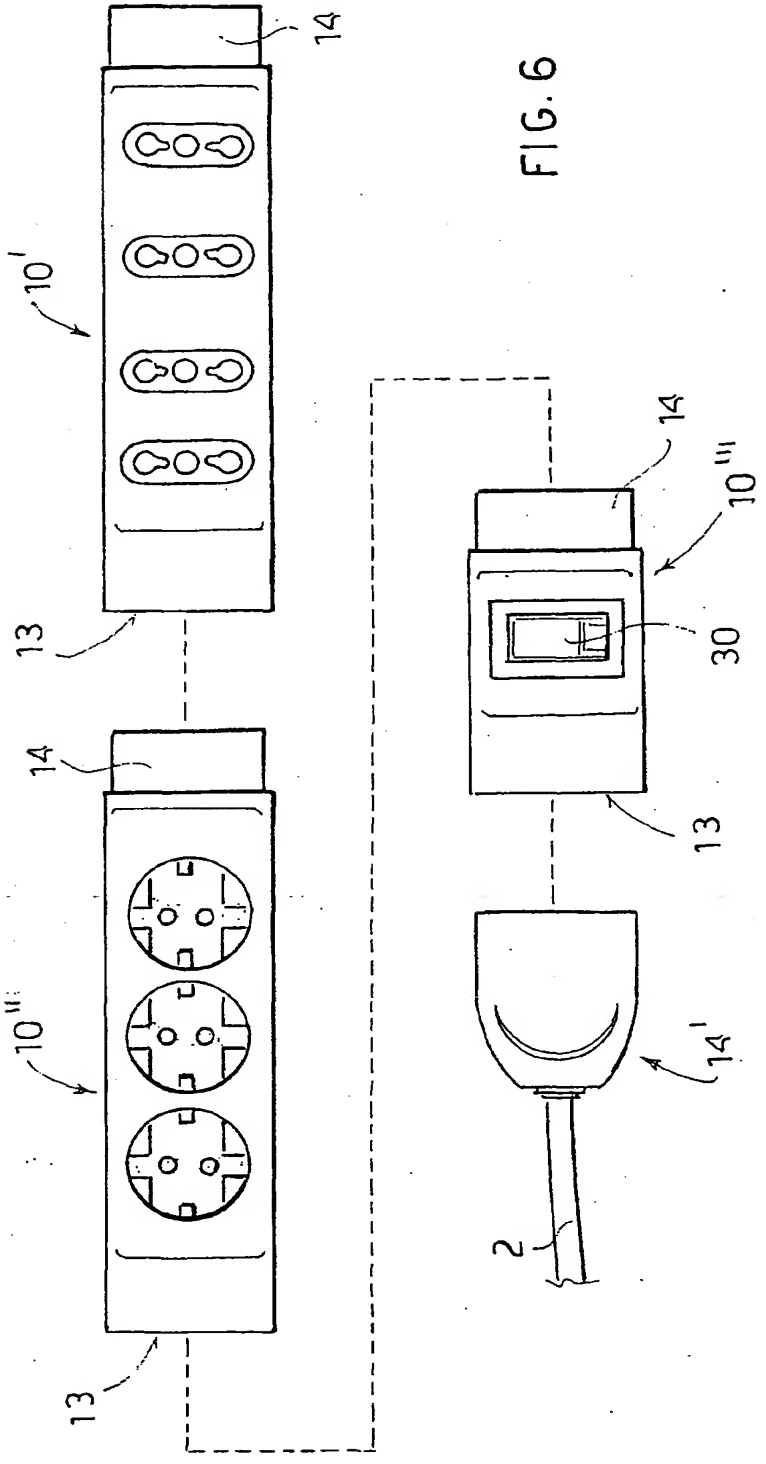


FIG. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 01 10 4693

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			TECHNICAL FIELDS SEARCHED (Int.Cl.7) H01R

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	7 August 2001	Criqui, J-J

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